IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Kevin G. Harding	)	
		)	Group Art Unit: 2627
Serial No.:	10/065,882	)	
		)	
Filed:	November 27, 2002	)	Examiner: Christopher R. Lamb
		)	
For:	MULTI-LAYER HOLOGRAPHIC DATA RECORDING METHOD	)	
		)	

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
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AMENDED APPEAL BRIEF

This Amended Appeal Brief is submitted in response to the Notice of Non-Compliant Appeal Brief, mailed October 3, 2006.

REAL PARTY IN INTEREST

The real party in interest is General Electric Company, the assignee of record as recorded at reel/frame 013271/0150.

RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

STATUS OF CLAIMS

Claims 5, 6, 11, 12, 15, 19 and 21 stand finally rejected.

The rejections of claims 5, 6, 11, 12, 15, 19 and 21 are herein appealed.

STATUS OF AMENDMENTS

There have been no amendments filed after the final rejection mailed June 9, 2006.

SUMMARY OF CLAIMED SUBJECT MATTER

A concise explanation of the subject matter defined in each of the independent claims involved in the appeal is provided. Citations to relevant portions of the disclosure are provided within the claim summary provided in this section. However, this list of citations is not exhaustive or limiting and is provided merely to assist the Board with determining where the claimed subject matter is described.

Claim 5 is directed to a method (page 4, lines 15 through page 6, line 2; Fig. 9, and additional other citations) of reading a set of data stored in a memory device (100, 200), including: causing a first optical beam (Fig. 4, 110, 210) to interfere (page 2, line 26 through page 3, line 19) with a second optical beam (Fig. 4, 112, 212) at a prescribed angle (Fig. 4, θ) therebetween (page 4, lines 15-18, 29-30; Fig. 4) at a first selected hologram (page 3, lines 26-30; page 6, lines 3-5; Fig. 1) containing at least a segment of the set of data and having a discrete location and a corresponding address (118) in the memory device (page 2, lines 26-28), generating thereby an N^{th} diffraction order wavefront (page 4, lines 115-27; Figs. 9-10, 126); wherein the first (110, 210) and second optical beams (112, 212) are characterized by a wavelength (λ_1, λ_2), an optical path length (L) (page 3, lines 19-20) and a state of polarization (page 6, lines 19-26); sensing the N^{th} diffraction order wavefront diffracted from the hologram (page 4, line 31 through page 5,

line 4); correlating the N^{th} diffraction order wavefront (126) with a correlation pattern which includes the set of data (page 5, lines 1-2); where N is an integer (page 4, line 19); if a correlation peak occurs, deconvolving the N^{th} diffraction order wavefront and the correlation pattern (page 4, lines 22-24; Fig. 10, 128); reading the set of data corresponding to the selected hologram and contained in the deconvolved N^{th} diffraction order wavefront (page 4 line 31 - page 5 line 1); and, reading (page 4, line 24) the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the wavelength (page 6, line 24) of one optical beam with respect to the other .

No "means-plus-function" or "step-plus-function" terminology is recited in claim 5.

Claim 6 is directed to a method (page 4, lines 15 through page 6, line 2; Fig. 9) of reading a set of data stored in a memory device (Fig. 7, 100, 200), the method comprising: causing a first optical beam (Fig. 4, 110, 210) to interfere (page 2, line 26 through page 3, line 19) with a second optical beam (Fig. 4, 112, 212) at a prescribed angle therebetween (Fig. 4, θ) at a first selected hologram (page 3, lines 26-30; page 6, lines 3-5; Fig. 1) containing at least a segment of the set of data and having a discrete location and a corresponding address (page 2, lines 26-27, 118) in the memory device (100, 200), generating thereby an N^{th} diffraction order wavefront (page 4, lines 115-27; Figs. 9-10, 126); wherein the first (110, 210) and second optical beams (112, 212) are characterized by a wavelength (λ_1, λ_2), an optical path length (L) and a state of polarization; sensing the N^{th} diffraction order wavefront (page 4, lines 115-27; Figs. 9-10, 126) diffracted from the hologram; correlating (page 5, line 2) the N^{th} diffraction order wavefront with a correlation pattern (page 5, lines 2-4, Fig. 10; 128) which includes the set of data; where N is an integer; if a correlation peak occurs, deconvolving (page 5, line 4) the N^{th} diffraction order wavefront and the correlation pattern; reading (page 5, line 4) the set of data corresponding to the selected hologram and contained in the deconvolved N^{th} diffraction order wavefront; and, reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the state of polarization (page 6, lines 22-24) of one optical beam with respect to the other.

No “means-plus-function” or “step-plus-function” terminology is recited in claim 6.

Claim 11 is directed to a method (page 4, lines 15 through page 6, line 2; Fig. 9) of reading a set of data stored in a memory device (Fig. 7; 100, 200), the method comprising: causing a first optical beam (Fig. 4, 110) to interfere (page 2, line 26 through page 3, line 19) with a second optical beam (Fig. 4, 112) at a prescribed angle therebetween (Fig. 4, θ) at a hologram having a discrete location and corresponding address (118) in the memory device (100, 200) generating thereby a interference pattern (page 3, lines 26-30; Fig. 9, 120); wherein the first (110, 210) and second optical beams (112, 212) are characterized by a wavelength (λ_1, λ_2), an optical path length (L) and a state of polarization; sensing an N^{th} diffraction order wavefront (page 4, lines 115-27; Figs. 9-10, 126) diffracted from the hologram; where N is an integer; wherein the N^{th} diffraction order wavefront (126) includes a correlation peak (Fig. 9, 122) signal and the holographically stored data; correlating (page 5, line 2, others) the holographically stored data and the correlation peak signal in the N^{th} diffraction order wavefront (126); if a correlation peak occurs, deconvolving (page 5, line 4) the holographically stored data and the correlation peak signal; reading (page 5, line 4) the set of data in the deconvolved N^{th} diffraction order wavefront (126); and, reading the set of data in the N^{th} diffraction order wavefront (126) for a second selected hologram by changing the wavelength (λ_1, λ_2) of one optical beam with respect to the other.

No “means-plus-function” or “step-plus-function” terminology is recited in claim 11.

Claim 12 is directed to a method (page 4, lines 15 through page 6, line 2; Fig. 9) of reading a set of data stored in a memory device (Fig. 7, 100, 200), the method comprising: causing a first optical beam (Fig. 4, 110, 210) to interfere (page 2, line 26 through page 3, line 19) with a second optical beam (Fig. 4, 112, 212) at a prescribed angle therebetween (Fig. 4, θ) at a hologram (page 3, lines 26-30; page 6, lines 3-5; Fig. 1) having a discrete location and corresponding address (page 2, lines 26-27, 118) in the memory device (100, 200) generating thereby a interference pattern (page 3, lines 2-18, Figs, 9, 10; 120); wherein the first (110, 210) and second optical beams (112, 212) are

characterized by a wavelength (λ_1, λ_2), an optical path length (L) and a state of polarization; sensing an N^{th} diffraction order wavefront (page 4, lines 115-27; Figs. 9-10, 126) diffracted from the hologram; where N is an integer; wherein the N^{th} diffraction order wavefront includes a correlation peak signal and the holographically stored data; correlating (page 5, line 2) the holographically stored data and the correlation peak signal in the N^{th} diffraction order wavefront; if a correlation peak occurs, deconvolving (page 5, line 4) the holographically stored data and the correlation peak signal; reading (page 5, line 4) the set of data in the deconvolved N^{th} diffraction order wavefront; and, reading (page 5, line 4) the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the state of polarization (page 6, lines 22-24) of one optical beam with respect to the other.

No "means-plus-function" or "step-plus-function" terminology is recited in claim 12.

Claim 15 is directed to a data storage memory device (page 2, lines 16-20, page 6, lines 3-11; 100, 200) comprising: a plurality of recording media (page 3, lines 5-18, 104) containing a set of holographically recorded data at discrete memory locations (page 3, line 1, Fig. 7, 118) therein wherein each memory location is identified by a corresponding memory address (page 3, line 1, Fig. 7, 118); means for creating an interference pattern (page 3, lines 2-18, Figs, 9, 10; 120) between two beams of light (110, 210; 112, 212) at a selected one of the discrete memory locations (page 3, line 1, Fig. 7, 118) in the recording media (104), generating thereby an N^{th} diffraction order wavefront (page 4, lines 115-27; Figs. 9-10, 126); means for sensing (page 5, line 1, Fig. 10; page 4, lines 1-8; Fig. 8; 404) the N^{th} diffraction order wavefront (126) emanating from the selected discrete memory location; means for reading (page 7, lines 17-page 8, line 11; page 4, lines 7-17; Fig. 11, 408) the holographically stored data from the N^{th} diffraction order wavefront (126); wherein the plurality of recording media (104) comprise layered holograms (Fig. 1, 104) and wherein the interference pattern (126) exists over a dimension less Fig. 4, *x*) than a thickness of the recording media (104) along the direction of travel of the beams of light (Fig. 4; 110, 210; 112, 212).

In claim 15, various "means-plus-function" terminology is recited. Specifically, there is a "means for creating." The means for creating is described at least on page 3, lines 2-18, Figs. 9, 10; page 3, lines 19-25; Fig. 3; page 5, line 9 - page 6 line 2; page 6, line 19 - page 7, line 7; 120. There is a "means for sensing." The means for sensing is described at least on page 5, line 1, Fig. 10; page 4, lines 1-8; Fig. 8; 404. There is a "means for reading." The means for reading is described at least on page 7, line 17-page 8, line 11; page 4, lines 7-17; Fig. 11, 408.

Claim 19 is directed to a data storage memory device (page 2, lines 16-20, page 6, lines 3-11; 100, 200) comprising: a plurality of recording media containing a set of holographically recorded data at discrete memory locations (page 3, line 1, Fig. 7, 118) therein wherein each memory location is identified by a corresponding memory address; means for creating an interference pattern (page 3, lines 2-18, Figs, 9, 10; 120) between two beams of light (110, 212) at a selected one of the discrete memory locations (page 3, line 1, Fig. 7, 118) in the recording media (100, 200), generating thereby an N^{th} diffraction order wavefront (page 4, lines 115-27; Figs. 9-10, 126); wherein the means for creating an interference pattern (120) between two beams of light (110, 212) comprises a coherent source of light; and wherein the two beams of light (110, 212) are crossed polarized with respect to one another and the means for creating an interference pattern comprises rotating at least one of the beams of light (page 6, line 17 – page 7, line 7); means for sensing (page 5, line 1, Fig. 10; page 4, lines 1-8; Fig. 8; 404) the N^{th} diffraction order wavefront emanating from the selected discrete memory location; and means for reading (page 7, line 17-page 8, line 11; page 4, lines 7-17; Fig. 11, 408) the holographically stored data from the N^{th} diffraction order wavefront.

In claim 19, various "means-plus-function" terminology is recited. Specifically, there is a "means for creating." The means for creating is described at least on page 3, lines 2-18, Figs. 9, 10; page 3, lines 19-25; Fig. 3; page 5, line 9 - page 6 line 2; page 6, line 19 - page 7, line 7; 120. There is a "means for sensing." The means for sensing is described at least on page 5, line 1, Fig. 10; page 4, lines 1-8; Fig. 8; 404. There is a "means for

reading." The means for reading is described at least on page 7, line 17-page 8, line 11; page 4, lines 7-17; Fig. 11, 408.

Claim 21 is directed to a data storage memory device (page 2, lines 16-20, page 6, lines 3-11; 100, 200) comprising: a plurality of recording media (Fig. 1, 104) containing a set of holographically recorded data at discrete memory locations therein wherein each memory location (page 3, line 1, Fig. 7, 118) is identified by a corresponding memory address; means for creating an interference pattern (page 3, lines 2-18, Figs, 9, 10; 120) between two beams of light (Fig. 4; 110, 210; 112, 212) at a selected one of the discrete memory locations in the recording media (104), generating thereby an N^{th} diffraction order wavefront (page 4, lines 115-27; Figs. 9-10, 126); wherein the means for creating an interference pattern between two beams of light comprises a coherent source of light (page 5, lines 5-8); and wherein the two beams of light are crossed polarized with respect to one another and the means for creating an interference pattern (page 3, lines 2-18, Figs, 9, 10; 120) comprises rotating at least one of the beams of light (page 6, line 17 – page 7, line 7); means for sensing (page 5, line 1, Fig. 10; page 4, lines 1-8; Fig. 8; 404) the N^{th} diffraction order wavefront emanating from the selected discrete memory location; and means for reading (page 7, lines 17-page 8, line 11; Fig. 11, 408) the holographically stored data from the N^{th} diffraction order wavefront; wherein the plurality of recording access media which cause a change in phase of the two beams of light (page 6, line 17 – page 7, line 7) with respect to one another generating thereby non-cross polarized beams of light.

In claim 21, various "means-plus-function" terminology is recited. Specifically, there is a "means for creating." The means for creating is described at least on page 3, lines 2-18, Figs. 9, 10; page 3, lines 19-25; Fig. 3; page 5, line 9 - page 6 line 2; page 6, line 19 - page 7, line 7; 120. There is a "means for sensing." The means for sensing is described at least on page 5, line 1, Fig. 10; page 4, lines 1-8; Fig. 8; 404. There is a "means for reading." The means for reading is described at least on page 7, line 17-page 8, line 11; page 4, lines 7-17; Fig. 11, 408.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 5, 6, 11, 12, 15, 19 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

In the first Office Action, mailed October 5, 2005, the Examiner rejected claims 1-4, 7-10, 13, 14, 1-18, 20 and 22. Claims 5, 6, 11, 12, 15, 19 and 21 were objected to, but considered allowable if rewritten. In response, claims 5, 6, 11, 12, 15 were rewritten according to the instructions of the Examiner.

In the second Office Action, mailed January 24, 2006, claims 5, 6, 11, 12, 15 were allowed. Claims 1-4, 7-10, 13-14, 16-18, 20 and 22 were rejected. Claims 19 and 21 were objected to. In response, claims 1-4, 7-10, 13-14, 16-18, 20 and 22 were canceled. Claims 19 and 21 were rewritten according to the instructions of the Examiner. All pending claims were placed in condition for allowance.

Another non-final Office Action was mailed on March 20, 2006. Claims 5, 6, 11, 12, 15, 19 and 21 were rejected under 35 U.S.C. §112, first paragraph as failing to comply with the enablement requirement. The Examiner generally asserted that the invention required "memory access media, which are not described in the specification to enable one skilled in the art to which it pertains to make and/or use the invention without undue experimentation."

A final Office Action was mailed on June 9, 2006. The Examiner rejected the remaining pending claims under 35 U.S.C. §112, stating, among other things:

> "The memory access media are thus crucial to select the second selected hologram, but are not further described in the specification to enable one skilled in the art to which it pertains to make and/or use the invention without undue experimentation." (page 3, with regard to claim 5).

> "Regarding claims 6 and 12, the subject matter,.... similarly requires the memory access media, which are not described in the specification to enable one skilled in the art to which it pertains to make and/or use the invention without undue experimentation."

The Examiner also alleged that claims 15, 19 and 21 required the "memory access media."

ARGUMENT

Introduction

There are two issues for consideration in this appeal. First, there is a question as to whether the teachings are enabled without memory access media. Second of all, there is a question as to whether memory access media is described in the specification adequately enough to enable one skilled in the art to which it pertains to make and/or use the invention without undue experimentation.

I. Are memory access media required ?

Referring to the specification, in paragraph [0017] it is stated that "it will be understood that **the memory address access media layer** 106 **can be** made optically thin, or **eliminated** while maintaining discrete holographic recording media layers 104."

Further, in paragraph [0023], the specification provides that "**the memory access media** 106 **causes** a phase shift in the optical beams 110, 112 thereby causing **an interference pattern** to be created at the corresponding hologram 114 and the data contained therein to be read out." The specification, in the same paragraph goes on to state "Although specific methods have been described, it is understood that **other means for creating an interference pattern** at a particular location within the holographic recording media **could be substituted** to operate in a similar manner without departing from the scope of the invention. **Alternate approaches** causing the holographic recording to be read out **may include matching the angular and wave shape content** of the reference beam of the holographic recording."

Claim 5 does not recite "memory access media." The method claim presented does not rely upon certain structural components for "changing the wavelength," as alleged by the Examiner. Claim 5 does not recite "memory access media" or "memory access material" (as called out by the Examiner).

Claims 6, 11, 12, 15, 19 and 21 do not recite "memory access media." These claims recite other aspects of the disclosure to provide for reading a set of data. Contrary to the assertion of the Examiner (last paragraph of page 5 of the Office Action of 6/29/2006), none of the claims are reliant upon "memory access media" to make and use the invention.

It appears that the Examiner is asserting that it is not possible to make and use the invention without undue experimentation, if the content of the memory access media is truly unknown. This assertion fails to account for embodiments disclosed in paragraph [0017] (and depicted in Fig. 4). This assertion also fails to account for alternate approaches, such as those disclosed in paragraph [0023], which may include matching the angular and wave shape content of the reference beam of the holographic recording.

It is respectfully submitted that "memory access media" are not required to establish the enablement of claims 5, 6, 11, 12, 15, 19 and 21. Accordingly, it is considered that relying upon any perceived inadequacies regarding memory access media for rejection of these claims is improper. Reconsideration and withdrawal is respectfully requested.

II. Is memory access media sufficiently described in the disclosure?

Any analysis of whether a particular claim is supported by the disclosure in an application requires a determination of whether that disclosure, when filed, contained sufficient information regarding the subject matter of the claims as to enable one skilled in the pertinent art to make and use the claimed invention. The standard for determining whether the specification meets the enablement requirement was cast in the Supreme

Court decision of Mineral Separation v. Hyde, 242 U.S. 261, 270 (1916) which postured the question: "is the experimentation needed to practice the invention undue or unreasonable?" That standard is still the one to be applied. In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

For the sake of argument, should it be considered that a description of memory access media is required, the following is provided. The following is not to be construed as an admission that a description of memory access media is required, at least on the basis of the prior conclusion.

Referring to the specification, aspects of the memory access media are defined. Reference may be had to paragraph [0027], which states, in part "The **memory address access media** 206 comprise materials which **cause polarization retardation** of an optical beam of a particular wavelength. It is known that cross polarized optical beams do not interfere. **Thus, by controlling the polarization rotation** of a pair of optical beams 210, 212, **the interference** thereof **can be controlled to allow the holographic reading** of a specific hologram 214."

The specification, in various places, such as paragraph [0017] and figures 1, 2, 3, 6 and 10, provide for embodiments of the memory access media in layers.

Materials in layer form that are suited for controlling polarization are known in the art. Reference may be had to U.S. Patent Nos.: 6,667,835, filed April 5, 2002; 6,657,690, filed December 2, 2001; 6,635,337 filed August 10, 2001; 6,096,375 filed February 16, 1999; and 4,388,375 filed June 14, 1983. These patents all disclose various forms of polarizing films. Considerable information regarding the techniques for achieving the polarization is provided. These patents also make reference to numerous other related references describing materials for controlling polarization.

Please note that these patents were identified during the preparation of this Appeal Brief, and were therefore not provided before in an Information Disclosure Statement.

The materiality of these patents has not been considered. These patents are submitted merely as examples of certain materials suited for controlling polarization.

It is respectfully submitted that the disclosure, when filed, contained sufficient information regarding the subject matter of the claims as to enable one skilled in the pertinent art to make and use the claimed invention (should one consider the claims to be reliant upon a definition for "memory access media"). That is, it is respectfully submitted that "memory access media" are adequately described in the specification to provide enablement in support of claims 5, 6, 11, 12, 15, 19 and 21. Accordingly, it is considered that relying upon any perceived inadequacies regarding memory access media for rejection of these claims is improper. Reconsideration and withdrawal is respectfully requested.

CONCLUSION

In conclusion, it is considered that the pending claims are not reliant upon a definition for "memory access media," as asserted by the Examiner. The term "memory access media" is not recited in the claims, and alternative techniques are disclosed. Further, it is respectfully submitted that the disclosure does provide sufficient information to enable one skilled in the pertinent art to make and use the claimed invention.

In view of the foregoing, it is urged that the final rejection of claims 5, 6, 11, 12, 15, 19 and 21 be reversed. A Notice of Allowance is respectfully requested.

If there are any charges with respect to this Appeal Brief or otherwise, please charge them to Deposit Account No. 07-0868 maintained by Applicants' attorneys.

Respectfully submitted,

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CLAIMS APPENDIX

1-4 (Cancelled)

5. (Previously presented) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a first selected hologram containing at least a segment of the set of data and having a discrete location and a corresponding address in the memory device, generating thereby an N^{th} diffraction order wavefront;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing the N^{th} diffraction order wavefront diffracted from the hologram;

correlating the N^{th} diffraction order wavefront with a correlation pattern which includes the set of data; where N is an integer;

if a correlation peak occurs, deconvolving the N^{th} diffraction order wavefront and the correlation pattern;

reading the set of data corresponding to the selected hologram and contained in the deconvolved N^{th} diffraction order wavefront; and,

reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the wavelength of one optical beam with respect to the other.

6. (Previously presented) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a first selected hologram containing at least a segment of the set of data and having a discrete location and a corresponding address in the memory device, generating thereby an N^{th} diffraction order wavefront;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing the N^{th} diffraction order wavefront diffracted from the hologram; correlating the N^{th} diffraction order wavefront with a correlation pattern which includes the set of data; where N is an integer;

if a correlation peak occurs, deconvolving the N^{th} diffraction order wavefront and the correlation pattern;

reading the set of data corresponding to the selected hologram and contained in the deconvolved N^{th} diffraction order wavefront; and,

reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the state of polarization of one optical beam with respect to the other.

7-10. (Canceled)

11. (Previously presented) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a hologram having a discrete location and corresponding address in the memory device generating thereby a interference pattern;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing an N^{th} diffraction order wavefront diffracted from the hologram; where N is an integer;

wherein the N^{th} diffraction order wavefront includes a correlation peak signal and the holographically stored data;

correlating the holographically stored data and the correlation peak signal in the N^{th} diffraction order wavefront;

if a correlation peak occurs, deconvolving the holographically stored data and the correlation peak signal;

reading the set of data in the deconvolved N^{th} diffraction order wavefront; and,

reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the wavelength of one optical beam with respect to the other.

12. (Previously presented) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a hologram having a discrete location and corresponding address in the memory device generating thereby a interference pattern;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing an N^{th} diffraction order wavefront diffracted from the hologram; where N is an integer;

wherein the N^{th} diffraction order wavefront includes a correlation peak signal and the holographically stored data;

correlating the holographically stored data and the correlation peak signal in the N^{th} diffraction order wavefront;

if a correlation peak occurs, deconvolving the holographically stored data and the correlation peak signal;

reading the set of data in the deconvolved N^{th} diffraction order wavefront; and,

reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the state of polarization of one optical beam with respect to the other.

13-14. (Canceled)

15. (Previously presented) A data storage memory device comprising:

a plurality of recording media containing a set of holographically recorded data at discrete memory locations therein wherein each memory location is identified by a corresponding memory address;

means for creating an interference pattern between two beams of light at a selected one of the discrete memory locations in the recording media, generating thereby an N^{th} diffraction order wavefront;

means for sensing the N^{th} diffraction order wavefront emanating from the selected discrete memory location;

means for reading the holographically stored data from the N^{th} diffraction order wavefront;

wherein the plurality of recording media comprise layered holograms and wherein the interference pattern exists over a dimension less than a thickness of the recording media along the direction of travel of the beams of light.

16-18. (Canceled)

19. (Previously Presented) A data storage memory device comprising:

a plurality of recording media containing a set of holographically recorded data at discrete memory locations therein wherein each memory location is identified by a corresponding memory address;

means for creating an interference pattern between two beams of light at a selected one of the discrete memory locations in the recording media, generating thereby an N^{th} diffraction order wavefront; wherein the means for creating an interference pattern between two beams of light comprises a coherent source of light; and wherein the two beams of light are crossed polarized with respect to one another and the means for creating an interference pattern comprises rotating at least one of the beams of light;

means for sensing the N^{th} diffraction order wavefront emanating from the selected discrete memory location; and

means for reading the holographically stored data from the N^{th} diffraction order wavefront.

20. (Canceled)

21. (Previously Presented) A data storage memory device comprising:

a plurality of recording media containing a set of holographically recorded data at discrete memory locations therein wherein each memory location is identified by a corresponding memory address;

means for creating an interference pattern between two beams of light at a selected one of the discrete memory locations in the recording media, generating thereby an N^{th} diffraction order wavefront; wherein the means for creating an interference pattern between two beams of light comprises a coherent source of light; and wherein the two beams of light are crossed polarized with respect to one another and the means for creating an interference pattern comprises rotating at least one of the beams of light;

means for sensing the N^{th} diffraction order wavefront emanating from the selected discrete memory location; and

means for reading the holographically stored data from the N^{th} diffraction order wavefront;

wherein the plurality of recording access media which cause a change in phase of the two beams of light with respect to one another generating thereby non-cross polarized beams of light.

22. (Canceled)

EVIDENCE APPENDIX

Exemplary patents disclosing materials for controlling polarization are provided. These patents include:

U.S. Patent Nos.:

6,667,835, filed April 5, 2002;

6,657,690, filed December 2, 2001;

6,635,337, filed August 10, 2001;

6,096,375, filed February 16, 1999; and

4,388,375, filed June 14, 1983.

RELATED PROCEEDINGS APPENDIX

NONE